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At a conference on "Education for Creativity in the American College," educators, artists and researchers considered the proposition that: "Little has been done to provide appropriate academic experiences for highly creative students during the post-adolescent years, and many colleges seem to lose more talented and creative students than they educate." Research is made difficult because too often, freshmen who combine high intelligence, interest in intellectual matters and apparent potential for creative work leave campus before follow-up tests and interviews can be held. It was found, however, that students who approach intellectual work in ways characteristic of creative people were less likely than others to graduate, even at MIT and another outstanding institute of science and engineering. Although students who enjoy independent thinking do tend to leave college earlier, it is not known whether this is related to actual creative productivity in academic and scientific fields. Creative people are made, not born, and research shows the lack of a distinct relationship between intelligence and creativity. The home environments of scientists, mathematicians and architects judged creative by associates were found to be similar and could well serve as models for colleges. If creativity embodies independent thinking, self-awareness, openness to experience and breadth of vision, education for creativity should be possible to develop in college. But there is no single program since the development of creativity seems to call for a balance between tensions in the educational environment. (JS)

ON CREATIVITY

by

K. Patricia Cross

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The Center for Research and Development in Higher Education

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On Creativity

"All too often we are giving our young people cut flowers when we should be teaching them to grow their own plants. We are stuffing their heads with the products of earlier innovation rather than teaching them to innovate. We think of the mind as a storehouse to be filled when we should be thinking of it as an instrument to be used."[1]

JOHN GARDNER

Should the American college plead guilty to thinking of students' minds as storehouses to be filled rather than as instruments to be used? What happens to the college student who possesses unusual capacity for original, innovative, and imaginative thinking? Do we know who he is? Is he likely to find encouragement for his creativity, or is he likely to be handed cut flowers instead? The questions are so vital and the answers so uncertain that the Center for Research and Development in Higher Education and the Education Extension of the University of California sponsored a conference on "Education for Creativity in the American College." Educators, artists, and research staff explored the topic from a variety of viewpoints.

The call to the conference charged that, "Little has been done to provide appropriate academic experiences for highly creative students during the post-adolescent years, and many colleges seem to lose more talented and creative students than they educate."

[1] Gardner, John. *Self-Renewal: The Individual and the Innovative Society.* Harper and Row, 1963.

Lisa was one who was lost from formal higher education: Dr. Paul Heist, Research Psychologist and Conference Coordinator, told her story:

"Perhaps it is not surprising that my first meeting with Lisa was an unconventional one. I met this young lady early in her sophomore year while engaged in research activities on her campus. As I was trying to gain admission to the office of the student newspaper, she happened by and asked congenially, 'Could I help you?' I explained that I was seeking some copies of the campus paper. She brushed back her long unkempt hair, thought for a moment, tried the door which I had already found locked, and then said, 'Oh, follow me.' On the outside of the building she reached up to push open the window and started to crawl in. Since this was more of a feat than she had anticipated, she laughed and said, 'Won't you give me a shove?' A bit embarrassed, I tried to lend a discreet hand, and together we managed. After a minute, she came out through the door with copies of every issue available.

"When I related this incident later to a faculty member on the campus, he described Lisa, spoke of her ability, her rather bizarre habits, and predicted that she probably would not find enough challenge on this campus to satisfy her. His prediction came true sooner than I might have guessed. By February, Lisa had left the college; I last saw her about a year and a half later when I visited her first art show in a private New York art gallery. She told me at that time of her plans to go to Europe to study and paint. Lisa, a girl with Scholastic Aptitude Test scores above the 98th percentile, and with all of the measurable characteristics of recognized creative persons, has by this time gone on to early acclaim in the arts and has found her way in life without the completion of formal education."

Of her experience with higher education, Lisa said, "My year and a half of college was a tight, unimaginative, insensitive routine, with the only real challenge and excitement coming from two or three fellow students and one class in literature."

Admittedly, Lisa differed in many ways from her more conventional classmates. It was not the unconventionality of her appearance, however, which marked her as a creative person, but rather the independence of her mind. In some measurable ways, Lisa is typical of many talented students who withdraw from institutions of higher education each year, seeking adventure and excitement in the world of ideas and seemingly unable to find them on the campus.

In the course of some longitudinal studies of students, Dr. Heist and his colleagues at the Center had observed that all too often freshmen who combined high intelligence, interest

in intellectual matters, and apparent potential for creative activity had left the campus by the time the research team returned for follow-up tests and interviews. To investigate this phenomenon, potentially creative students were identified by the similarity of their patterns of attitudes and interests to those of students who earlier had been classified as creative through a process of nomination by peers, faculty agreement, and analysis of records. And indeed it was found that students who tended to approach intellectual matters in ways characteristic of creative people were less likely than other students to graduate from college. The three highly regarded colleges shown in figure 1 lost more potentially creative students than they graduated. Even in college A, which attracts a student body with an extremely high proportion of the potentially creative (63 per cent), more than half of these students leave (53 per cent), and this is almost double the rate of attrition for the other students in the college (28 per cent).

The situation is not much better in two outstanding colleges of engineering and science. In his account of a broad, long-range study of MIT students, Dr. Benson Snyder, Psychiatrist-in-Chief at the Massachusetts Institute of Technology, also reported discouraging findings. He found that students who scored high on the three scales of the Omnibus Personality Inventory (OPI)[2] used to identify the creative personality were more likely to leave MIT than were students who scored low on these scales.

The three OPI scales selected by the MIT investigators and the authors of the Inventory were those on which the attitude statements appeared to describe traits commonly associated with creative thought, especially as exhibited in an academic context. The measured characteristics can be briefly described as follows:

The *Thinking Introversion* scale measures an interest in reflective and imaginative thinking as opposed to action. High scorers say they derive pleasure from analytic, deductive thinking and find excitement in intellectual activity. They tend to think of themselves as autonomous and independent.

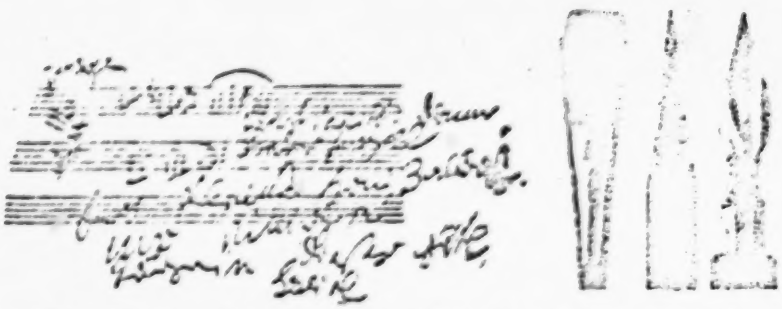
The *Complexity* scale assesses tolerance for the unstructured and desire for new and complex experiences. High scorers enjoy "fooling around" with ideas and are not disturbed by a lack of clear-cut answers or tangible outcomes.

The *Impulse Expression* scale assesses general need for immediate gratification with a relative intolerance of delay. High scorers place little reliance on set schedule, orderliness in dress, or conventionality in attitudes. They also tend to express interest in rebellious adventure with an exhibitionist flavor.

The MIT study took a careful look at students who scored very high or very low on these three self-descriptive scales[3] and found that on all three scales, high scorers were significantly more likely ($p < .01$) to leave the institution than were low scorers. The findings were especially dramatic in the data from the Complexity scale. In Dr. Snyder's words, "The institution is losing three times as many students who as freshmen preferred to try out new solutions, 'fool around' with ideas, or take cognitive risks, as it is students preferring a well-ordered life with tangible results."

When students indicating a preference for complex experiences did remain at MIT, they were considerably more likely, by their senior year, to be found in the school of science than in the school of engineering. There was one notable exception to this, however, and it holds promise for faculty interested in educating for creativity. Dr. Snyder found that the greatest increase in Complexity scores from freshman to senior years occurred among students in an engineering curriculum. In this particular major, there was a design project course in the junior year in which the professor literally told students, "Let yourselves go; make a mistake." Throughout our high-pressure system of education today many students feel that the price of "making a mistake" can be too costly. To take but one example, many students hesitate to venture into fields with unfamiliar subject matter lest the choice of a few "wrong" courses dash all hopes for graduate school. Some colleges, recognizing that intellectual adventure requires the courage to be found wrong, permit students to take some courses for which they may be ill-prepared, without being graded.

Using somewhat different measures for the identification of potentially creative students, Dr. Heist found a repeat of the MIT experience in another outstanding college of science and engineering. At the end of the second year of a four-year Center study, it was found that about one-third of the class being studied had withdrawn. Half of these had above average grades at the time of withdrawal, and these able dropouts showed a highly distinctive profile on the Allport, Vernon, and Lindzey *Study of Values* (AVL). They ranked high in theoretical and aesthetic values and low in economic and religious interests when compared either with those who persisted in the college or those who dropped out with below average grades. The hunch that the high achieving dropouts represent potentially creative people is strengthened when the AVL profiles are compared with those of MacKinnon's mature scientists, architects, and mathematicians who have proved themselves highly creative in their professions. MacKinnon has found that the highest AVL values for all of his creative groups were the theoretical and aesthetic.[4]



The attrition figures reported by Heist for this institute of science and engineering parallel those for colleges in the other studies reported at the conference. Fifty-nine per cent of all students with "creative" AVL profiles withdrew before graduation as compared with 29 per cent of those with profiles not similar to those of recognized creative persons.

The researchers at the conference appeared to agree that students who say they enjoy a kind of free-wheeling, independent thinking about complex ideas without regard to practical consequences tend to leave our institutions of higher education. Whether this enjoyment of cognitive activity is significantly related to creative production in academic and scientific fields is still open to question since creative contributions have necessarily been limited by the relative youth of the subjects. Perhaps many of the students who drop out of college have the potential for creative contribution but lack the discipline to realize their full talents. It may well be that that small minority of students showing "creative profiles" *and* remaining in college until graduation are the ones who will

[2] The Omnibus Personality Inventory is a research instrument developed at the Center to assess personality dimensions appropriate to the study of college students. It is not now available for use outside of Center projects, but plans are underway for public distribution in about a year.

[3] The extremes were defined as those scoring 1½ standard deviations above or below the mean of 721 MIT freshmen. This is roughly the upper and lower 7 per cent.

[4] MacKinnon, Donald. The nature and nurture of creative talent. *American Psychologist*, 1962, *17*, 484–495.

make the meaningful contributions in the scientific and academic fields. Long-term research may give us some needed answers. In the meantime, the statistical rarity of creative persons makes the questions regarding the nurture of their talent of vital concern to educators at every level.

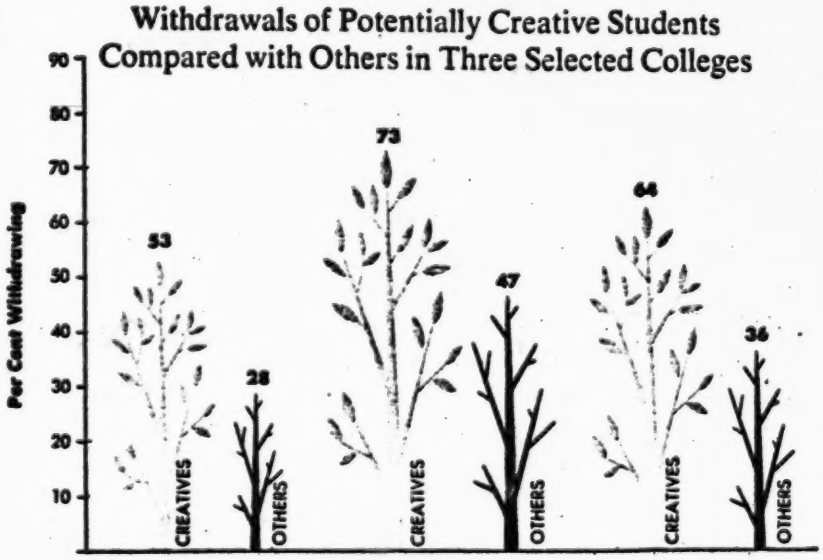
Dr. Donald MacKinnon, Director of the Institute for Personality Assessment and Research, University of California, Berkeley, and a member of the Center's Advisory Board, has been looking at creativity by starting at the other end—with mature men and women who have demonstrated their creativity by the product of their work. Here are known creative people. How did they get that way?

In all probability, creative people are not born; they are made. Contrary to popular belief, a creative person is not necessarily a genius as measured by tests of intellectual ability. Dr. MacKinnon told the conference, "It simply is not true that the more intelligent person is necessarily the more creative one . . . if a person has the minimum intelligence required for mastery of a field of knowledge, whether he performs creatively or banally in that field will be crucially determined by nonintellectual factors . . . We would be foolish to select students for admission to college who have the lowest scores on intelligence tests, but, on the other hand, we are clearly deluding ourselves when we favor one student over another solely on the grounds that he scores some ten to twenty points higher on some measure of intelligence."

This lack of a distinct relationship between intelligence and creativity is also illustrated in figure 1. Although the students at college A score near the 70th percentile on the Scholastic Aptitude Test, and the students at college C near the 95th percentile, the difference between the proportions of students with "creative" profiles in the two student bodies is startling: 63 per cent in college A; 15 per cent in college C.

Grades in high school or college are no more effective than tests of ability in distinguishing those who will become creative. High school grade point averages showed no correlation with later creativeness, and only in the case of architects did college grades show a significant correlation (+.27) with rated creativeness. Typically, creatives were *B* students who were extraordinarily independent as students. They did *A* work in courses that caught their interest but little or no work in courses that failed to stir their imagination. Dr. MacKinnon suggested that ". . . if we really wish to select for creative potential, we should pay more attention to patterns of low and high grades, or improving grades as the student does more advanced work in the field of his major interest . . ."

FIGURE 1
Withdrawals of Potentially Creative Students Compared with Others in Three Selected Colleges



College	A	B	C
Number	122	341	178
% Creatives in Class	63	9	15

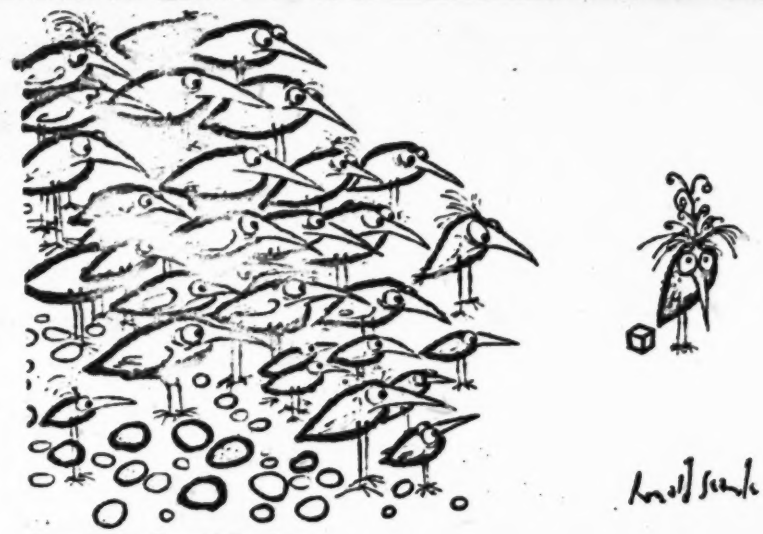
As they looked back on their early childhood experiences, scientists, mathematicians, and architects judged creative by their professional associates reported some similarities. The independence so obviously a mark of the creative person appears to have been fostered, according to MacKinnon, "by parents who very early showed an extraordinary respect for the child and confidence in his ability to do what was appropriate. The expectation of the parent that the child would act independently but reasonably and responsibly appears to have contributed much to the sense of personal autonomy which was to develop to such a marked degree." MacKinnon noted further that "these parents did not leave the life space of the child unstructured . . . There existed clear standards of conduct and ideas as to what was right and wrong, but at the same time there was an expectation, if not requirement, of active exploration and the internalization of a framework of personal conduct. Discipline was almost always consistent and predictable. In most cases there were rules, family standards, and parental injunctions which were known explicitly by the children and seldom infringed. Thus there appears to have been both structure and freedom which carried with it expectations of reasonable and responsible action . . ."

There was an implied guide to action in what Dr. MacKinnon had to say: ". . . the college or the university that can create an atmosphere similar to that of the homes of those who were to become so highly creative would contribute importantly to nurturing the creative potential of its students. And this . . . is different from the kind of unstructured campus which some seek today, a campus on which there would be no rules to regulate the manner, time, and place for the activities appropriate to college life."

Other observations about the home environment of creative people led to further suggestions which might be tested in education. There appeared to be models present in the homes of creative people—fathers who demonstrated resourceful behavior in demanding careers, mothers with careers of their own, grandfathers who occupied responsible positions in the community.

Ralph Gleason, columnist for the *San Francisco Chronicle* and a nationally recognized authority on jazz, made particular note of the presence of models in the lives of his nominees for the ten greatest jazz musicians of all time. Three of the ten jazz artists had fathers who were musicians, and the role of fellow musicians in the teaching of this highly complex and creative art was apparent in the lives of all. Not one of the ten had been encouraged in his pursuit of jazz by the established educational system. Mr. Gleason pointed out that, unlike European schools, there seems to be a conspiracy in American schools to keep this uniquely American art form out of the classroom, concert halls, and school assemblies. He questioned whether the American educational system was formalized and routinized to the extent that opportunities for spontaneous creative expression were stifled.

Vittorio Giannini, President of the North Carolina School of the Arts, and a widely recognized composer and musician, was surrounded by models in childhood, with father, mother, two sisters, and a brother all actively engaged in the field of music. He attributed his joy in creative expression to the advantage



Drawing by Ronald Searle;
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he had in being "born and raised in a family where there was always artistic expression, a great deal of imagination, and strict discipline." His belief in creating an environment with stimulating models and expert instruction led to his active participation in founding the North Carolina School of the Arts, which accepts highly talented students of any age. Here, surrounded by students and faculty of similar interests and dreams, the talented student experiences the satisfaction of complete involvement in artistic expression.

Dr. Nevitt Sanford, Professor of Psychology and Education at Stanford University, summarized the papers presented at the conference by concluding that, "If the disposition to creativity embodies such traits as independence of thinking, self-awareness, openness to experience, and breadth of view, then we are talking about something that can be developed in college. In a sense, we are talking about creativity as self-fulfillment, and here no one can be excluded . . . Education for creativity, then, would seem to be much like good general education."

If higher education is failing the student with potential for creative contribution, as the research reports and the observations of artists appear to indicate, then, as Dr. Sanford suggests, it may also be falling short in meeting some more basic goals.

Speakers at the conference were in agreement that it is probably not possible to develop a specific program to educate for creativity. Dr. MacKinnon underlined this view by remarking that, "The wide range of individual differences must surely mean that there is no single method for the nurturing of creativity . . . we should remember that the same fire that melts the butter hardens the egg."

The development of the creative person seems to call for a balance between tensions in the educational environment. The creative person must be stimulated and he must be left alone. He must be encouraged to develop the discipline to master the knowledge in his field and permitted the freedom to question it. He must be offered models of creative behavior and allowed the independence to reject conformity to any model. He must be extended the freedom to advance new ideas that won't work and given the encouragement to keep seeking those that will. He must be helped to forsake the comfort of dealing with facts and urged to undertake the adventure of grappling with ideas.

There is no formula for the balance between such tensions; the proper balance will vary from student to student and from time to time. Education for creativity is, in all likelihood, an environment rather than a program.

The proceedings of the conference on which this report is based will be available after June 1.

—K. Patricia Cross

A New Perspective on Statewide Planning

The less obvious and possibly unintended effects of statewide planning and coordination in higher education will be the subject of a Center study under the direction of Ernest Palola.

This study, entitled "Statewide Planning in Higher Education—A Study of Planned Organizational Change," will examine the local effects of statewide planning to see whether shifts in kinds of decisions made at the institutional level result in qualitative changes in the character and functions of the institution. The research will focus on planning in five states—California, New York, Florida, Illinois, and Texas.

Most observers emphasize the pragmatic gains from statewide planning—avoidance of unnecessary duplication of courses, curricula, and programs; rational allocation of limited finances; minimization of political battles among institutions for legislative support.

Palola points out that "some argue that statewide planning is the only way to preserve diversity and distinctiveness among institutions, while others oppose statewide planning as necessarily forcing greater conformity and similarity among colleges and universities. If it is true that the distinctive educative functions of institutions are being redefined or replaced, then we might inquire into the consequences of these changes for the future direction of higher education. Or, is there an alternative approach which preserves the individuality of colleges and universities while effecting a reasonable level of economy and efficiency?"

Although the research will examine both the advantages and disadvantages of statewide planning for institutions, the major thrust is to see how planning affects the level of formalization and centralization of decision making in statewide systems and whether this, in turn, creates problems for the growth and development of individual institutions. If critical educational issues are being increasingly decided outside local institutions, then it is expected that power struggles will emerge and that this may lead to or demonstrate important shifts in the power centers within higher education.

In this context, shifts in decisions which affect the institutional mission are regarded as particularly volatile—decisions concerning faculty teaching loads, instructional methods, research support, graduate degrees, programs, and curricula.

The study also will explore the causes and effects of organized reactions against statewide plans. Reactions to statewide planning are expected to be different for various colleges and universities. Newly emerging institutions may find statewide planning overly confining; others may be unwilling to live within the role and scope assigned; while still other institutions may see statewide planning as enhancing their role in the state's system of higher education. Private sectors of higher education, to the extent that they are involved, seem uneasy partners in statewide planning, perhaps due to their traditional independence and the uncertain consequences of statewide planning for them. Some open signs of resistance exist in California among the state colleges. Similar reactions may occur in other states.

The design for the study calls for semi-structured interviews and mail-back questionnaires at approximately fifteen to twenty carefully selected public and private institutions in each of the five states. Another twenty per cent of the institutions from the same states will be covered via a comprehensive questionnaire. Campus administrators and faculty will be interviewed, as well as other people concerned with statewide planning, such as state officials, legislators, and staff of coordinating agencies.